Peter McKenzie Armstrong

Patterns

from the

Game of Life

Part I: Eighth Notes for Toy Piano

Revised Edition
Opus 27

Edition Ottaviano Petrucci

NOTES

COMPOSITION

In continued fascination with J.H.Conway's cellular automaton, I have collected several hundred patterns from the Game of Life website (ConwayLife.com) and set about to realize some as music with minimal change to their mapped specs.

Of three volumes resulting, this first "for toy piano" evolved from those images with vertical dimensions of 1 to 25 units, translating to keyboard ranges of from 1 pitch to 2 octaves. Its pieces are named for their semitone ranges in order.

Regarding clusters: As default chord content was often unmanageable for both scoring and performance, I have trimmed accordingly and imposed two notational constraints: each chord has a single stem; its intervals are as a rule spelled diatonically, with accidental–types consequently mixed.

The Game of Life dot graphs underlying these pieces (up to eight for each) are listed – by pattern name, discoverer, date – at score's end. For full information on any, access ConwayLife.com/wiki/Category:Patterns and click on its name. For comments as to my treatment, see the NOTES in two earlier compositions, *Thin Rake* and *No!*, at imslp.org/wiki/Category:Armstrong,_Peter_McKenzie.

Audio files at IMSLP accompanying this score, initially secondary output from the LilyPond processing, have been separately rewritten by the composer in RoseGarden and realized via PianoTeq's "D4 Vintage Bosendorfer" instrument. Individual durations range non–sequentially from 11 to 29 seconds, totaling 8:16.

PERFORMANCE

PROGRAMMING
I imagine this work being played, not in its entirety, but in variously selected handfuls of from three to perhaps seven items at most. Players inspired to take "toy piano" literally will need to access a 30–key model, the shortest offering two full octaves centered on 'D'.

CLUSTERS
As chords will for some hands be occasionally unnavigable, the player is invited to trim them further – discretely – where needed, most specifically to avoid rolling.

ACCIDENTALS
With the exception of natural–signs (all cautionary), accidentals throughout apply each exactly once. LilyPond terms this style "Forget".

ARTICULATION
Non–slurred notes are to be audibly detached, and any slur's end–note is to be similarly detached from the next event. Where, as often occurs, slurs contain immediate note–repetition, their *legato* connection must be effected with the damper pedal (without "smooth–over" between slurs). There are no ties.

DYNAMICS
Marked accents enhance or contradict normal beat stress, which is itself to be exaggerated in compound &/or changing meter.

TEMPO
Metronome settings are intended suggestively.

– PMA

to Rebecca Raffaelli

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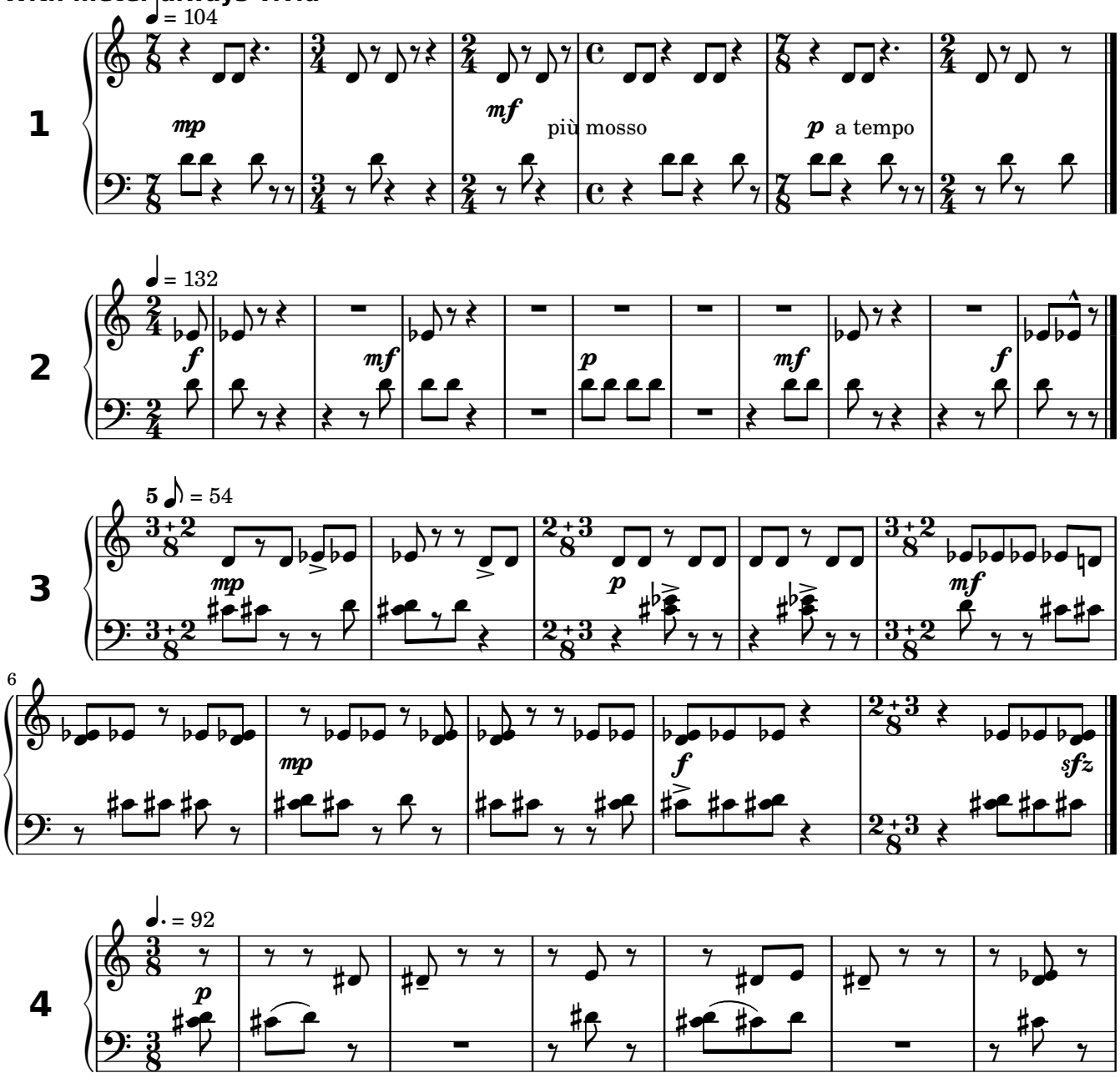
With meter always vivid



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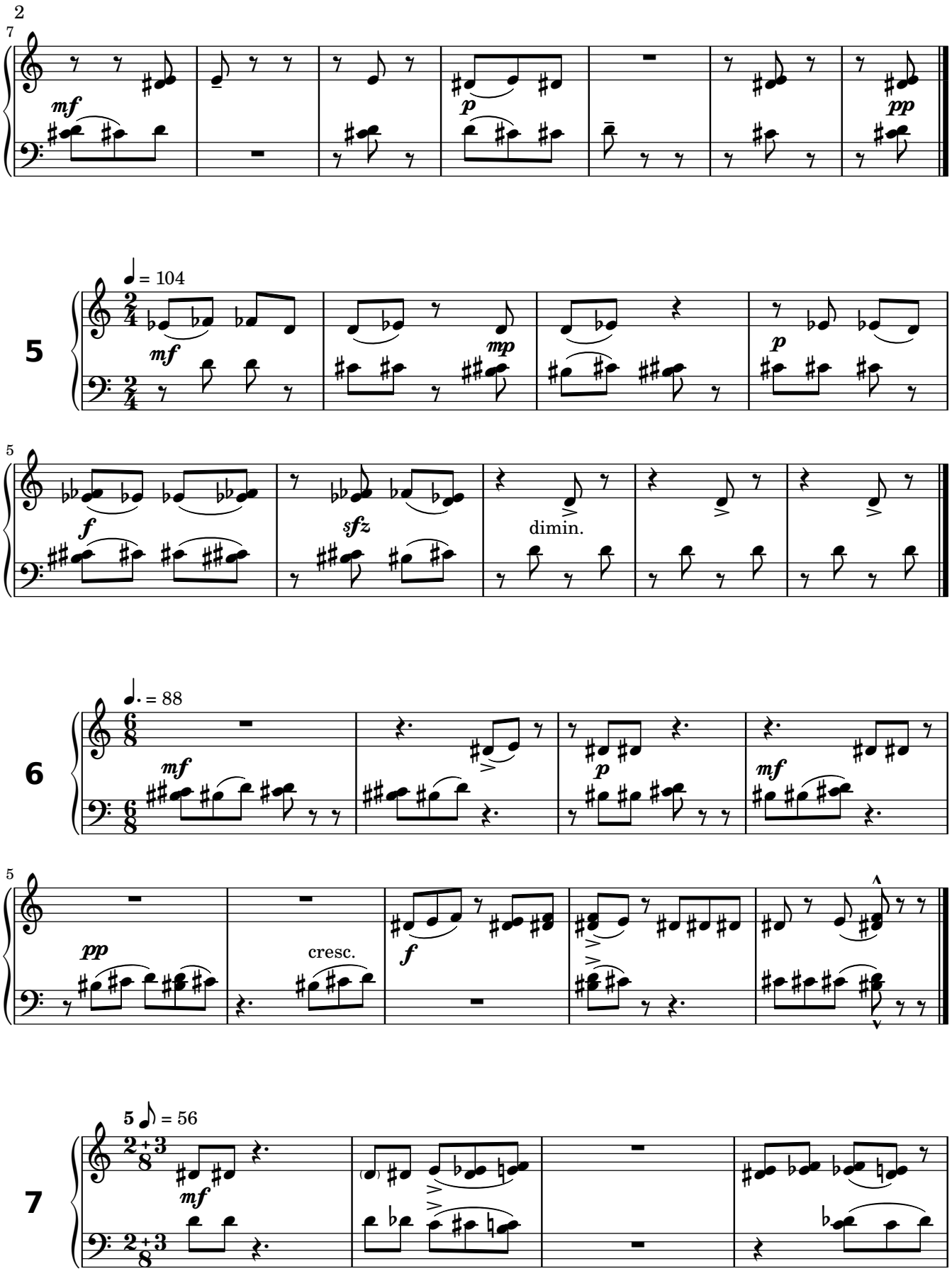
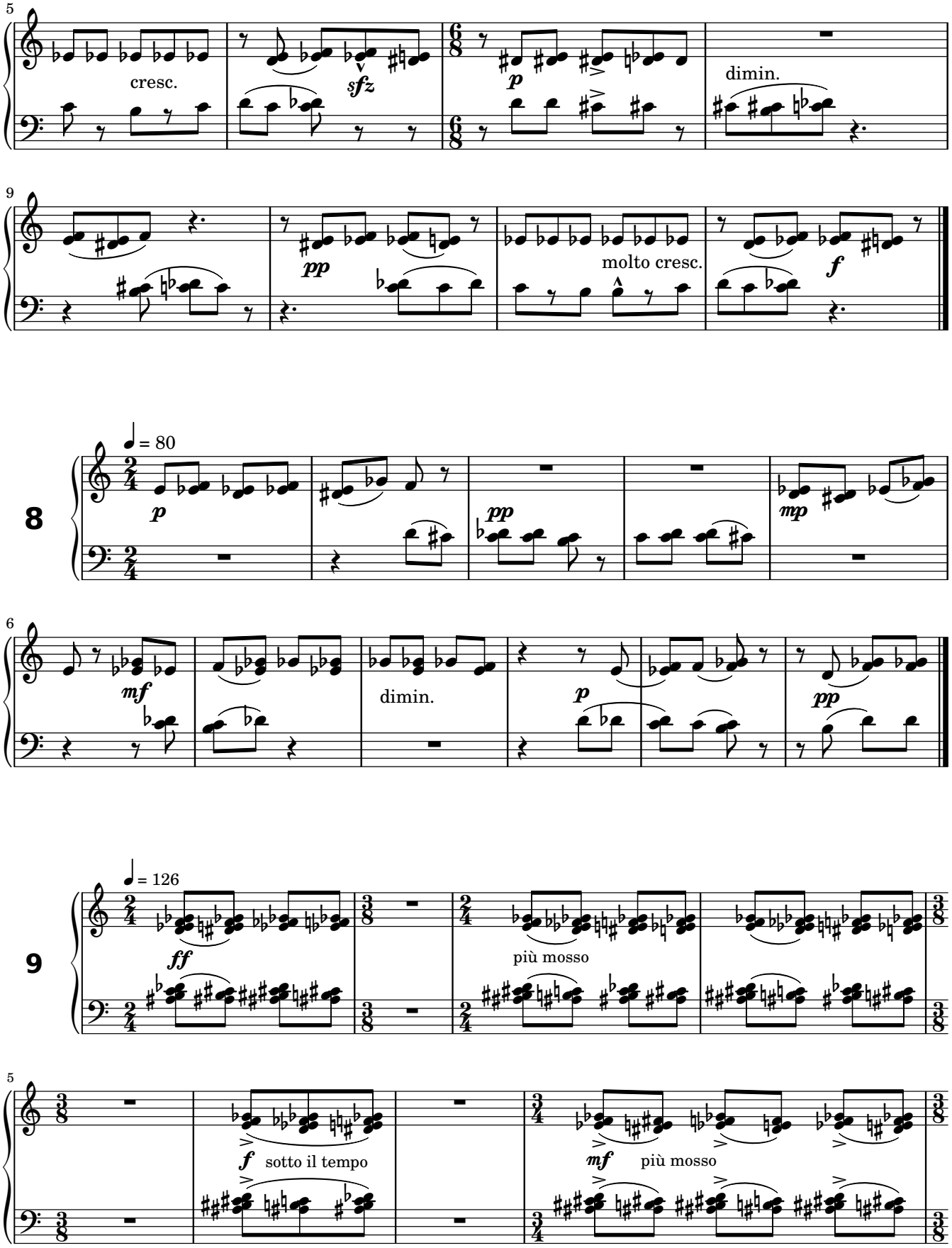
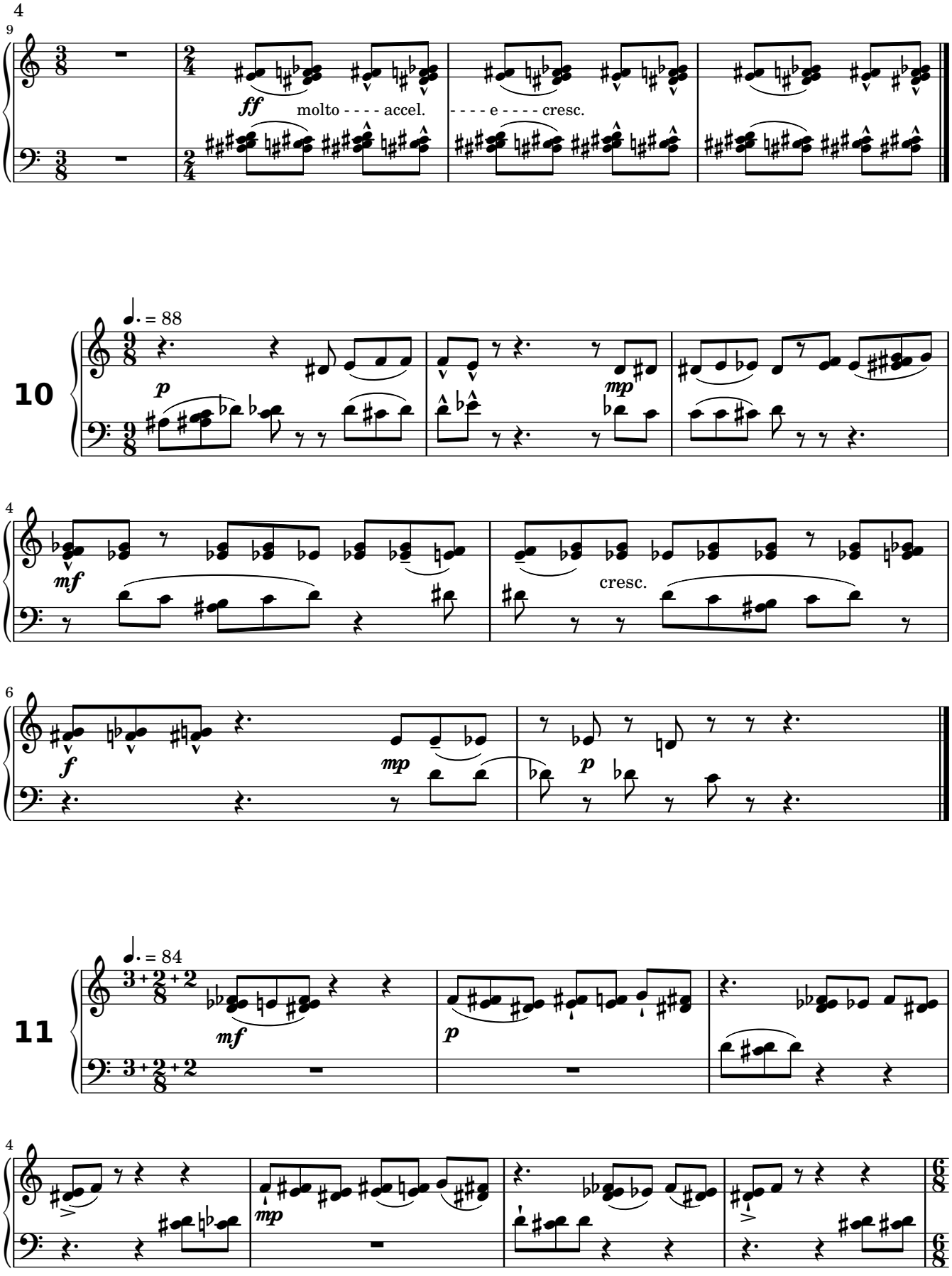
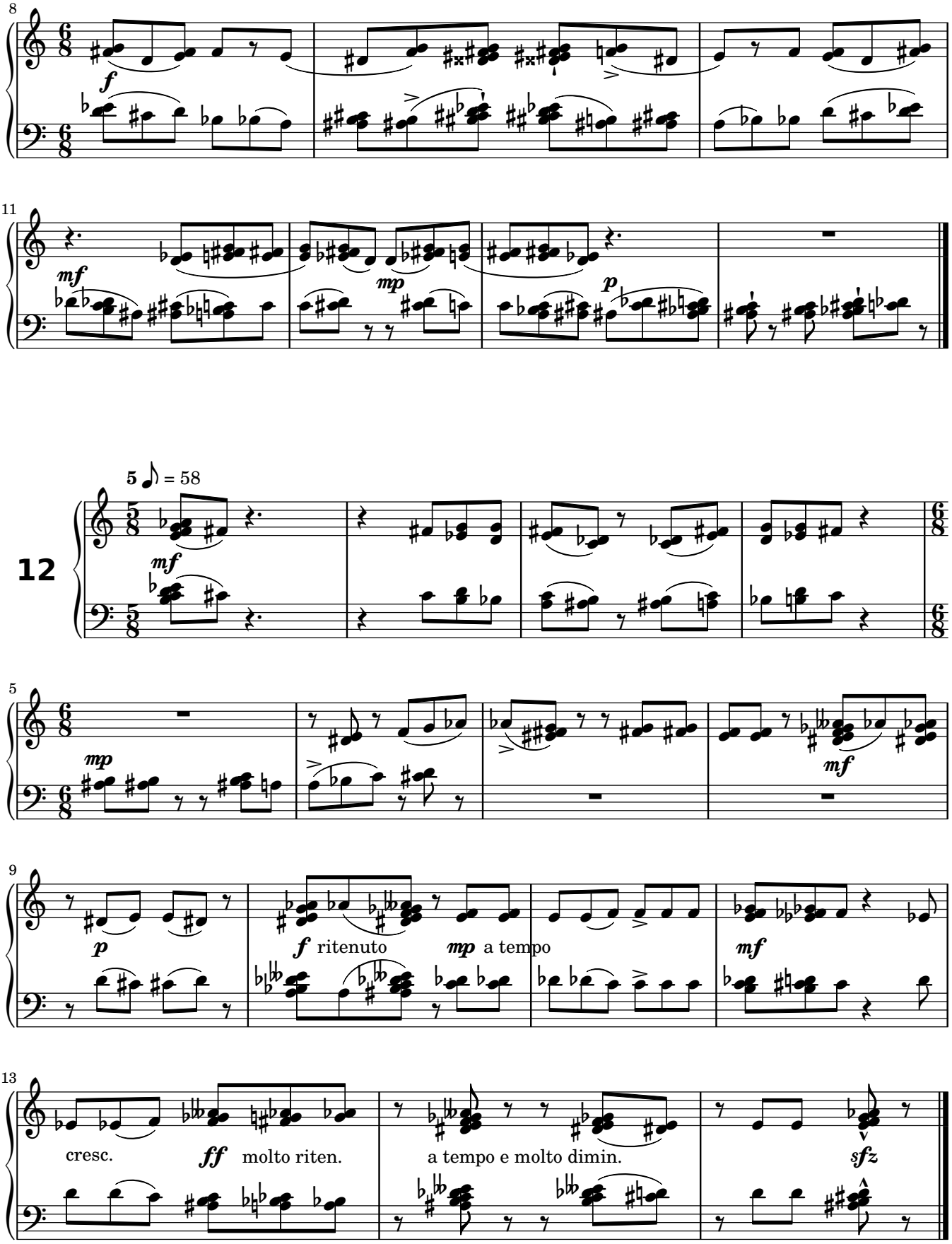
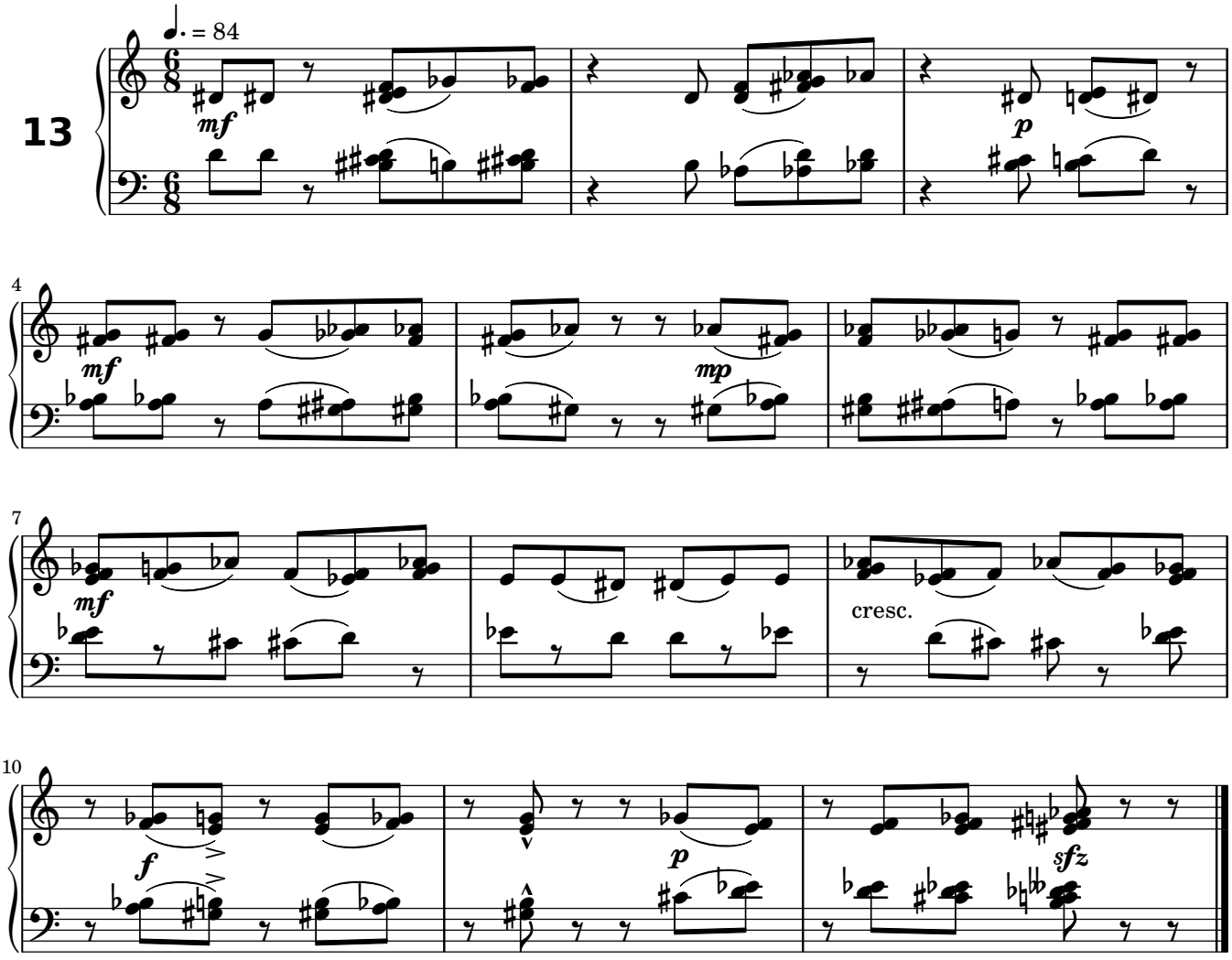
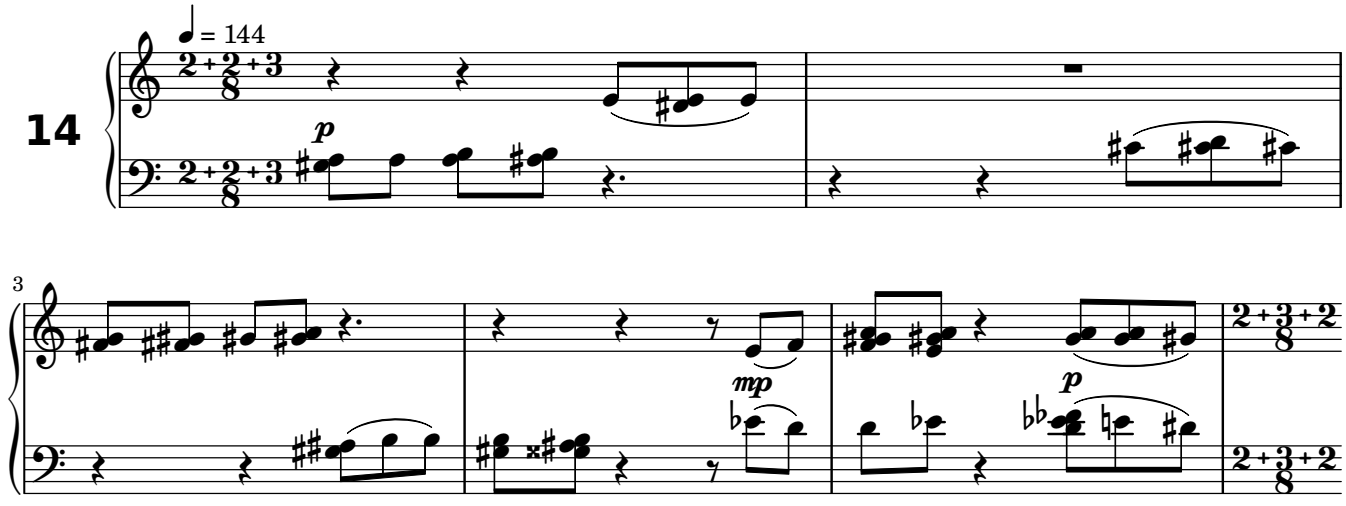

2
7
mf
p
pp
5
♩ = 104
mf
mp
p
5
f
sfz
dimin.
6
♩. = 88
mf
p
mf
5
pp
cresc.
f
7
5 ♪ = 56
mf

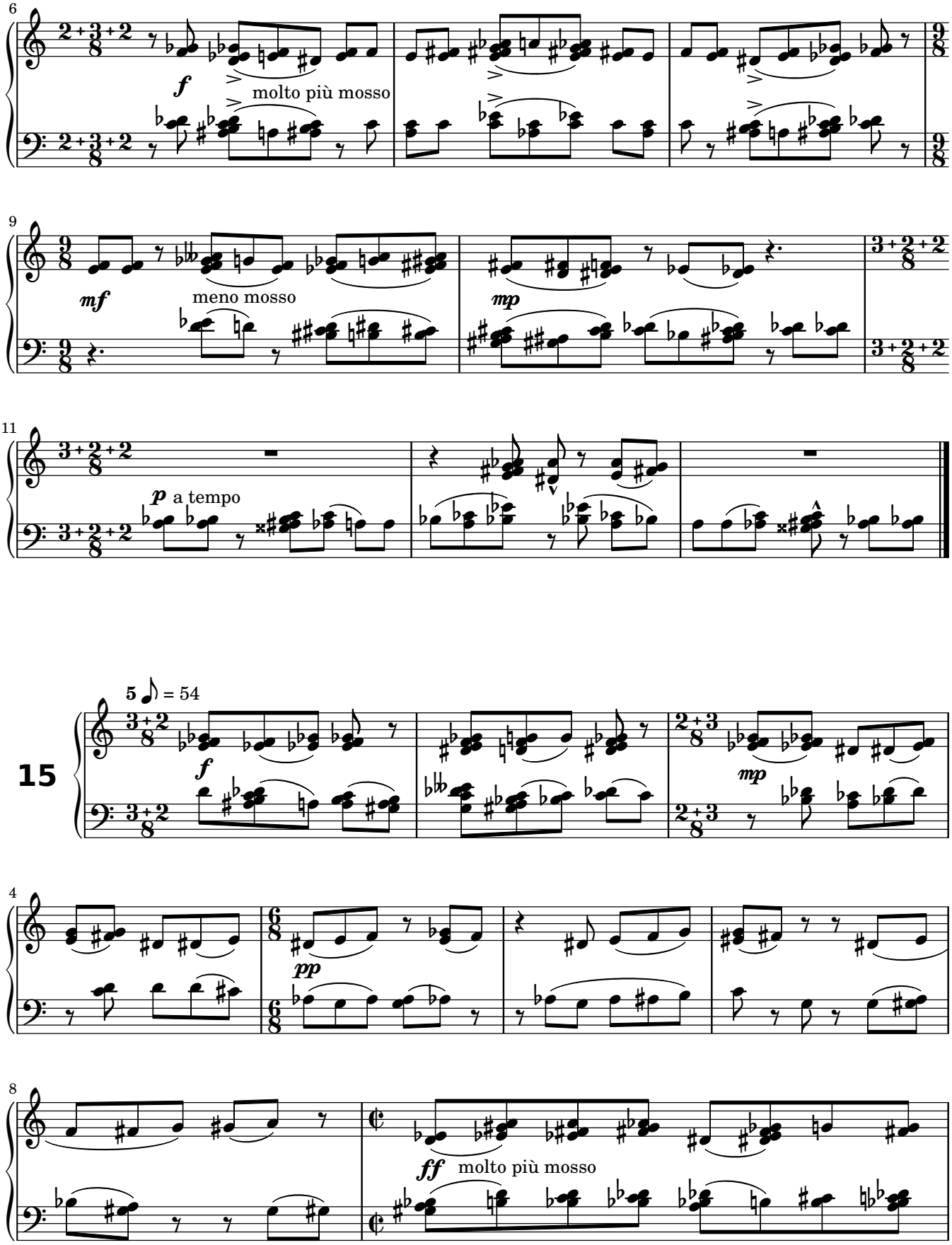

5
cresc.
sfz
p
dimin.
9
pp
molto cresc.
f
8
= 80
p
pp
mp
6
mf
dimin.
p
pp
9
= 126
ff
più mosso
5
f sotto il tempo
mf più mosso

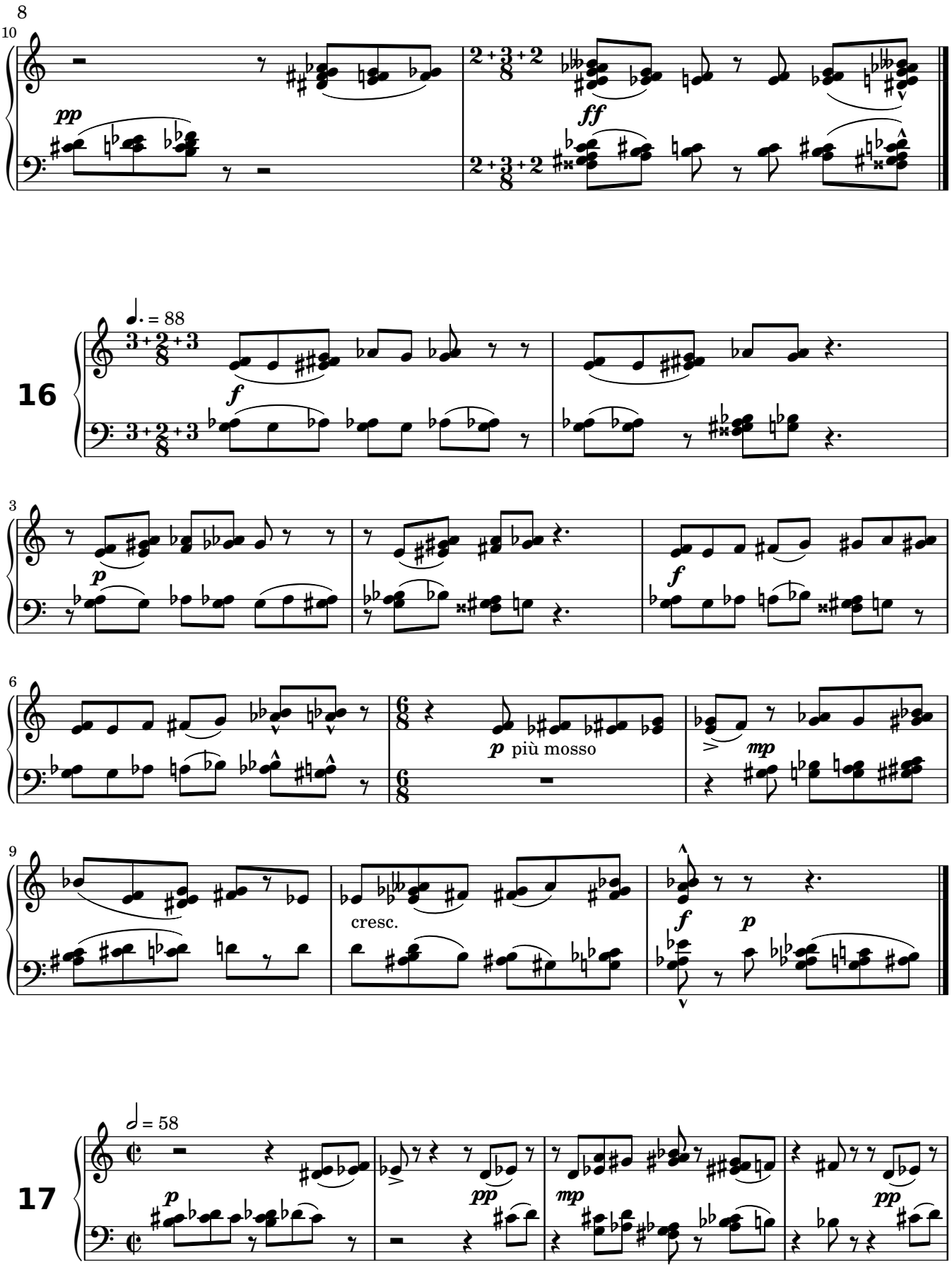

4
9
ff
molto - - - - accel.
- - - - e - - - - cresc.
10
♩. = 88
p
mp
4
mf
cresc.
6
f
mp
p
11
♩. = 84
mf
p
4
mp

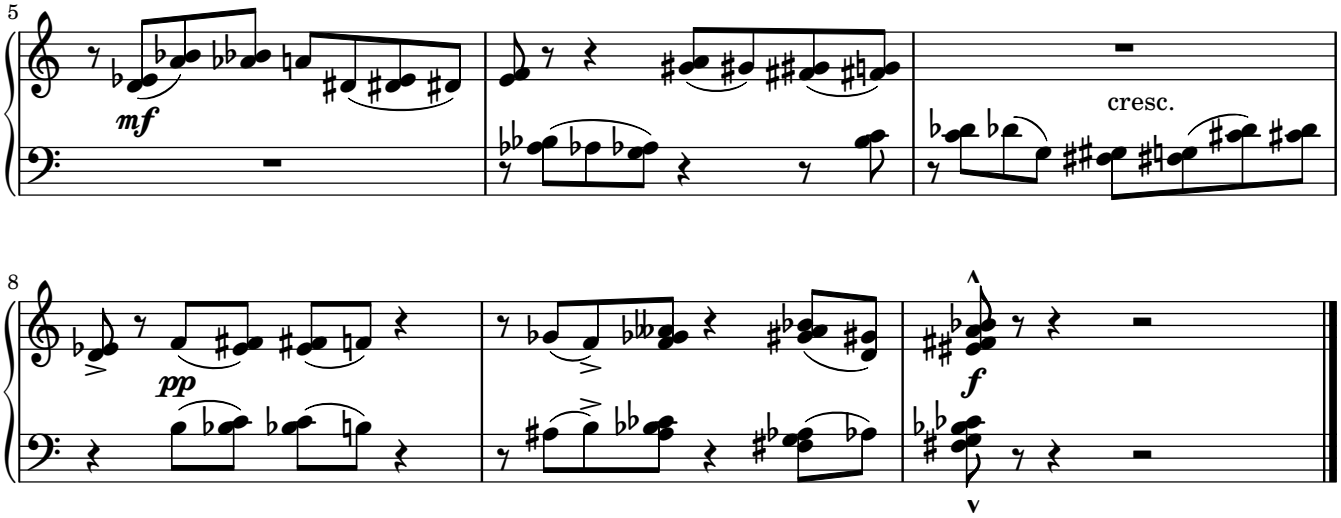

8
f
11
mf
mp
p
12
5 = 58
mf
5
mp
mf
9
p
f ritenuto
mp a tempo
mf
13
cresc.
ff molto riten.
a tempo e molto dimin.
sfz

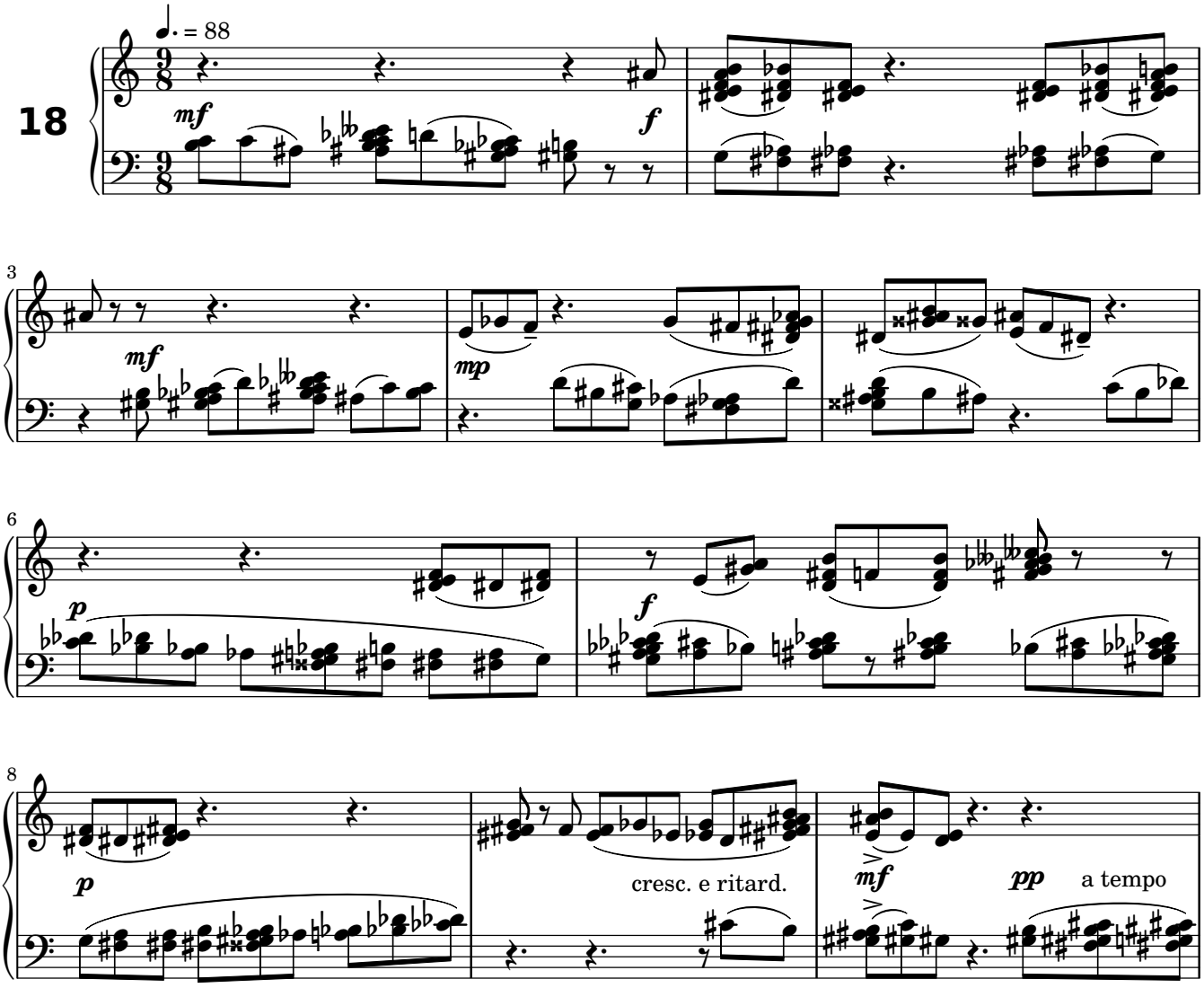

13
♩. = 84
mf
p
4
mf
mp
7
mf
cresc.
10
f
p
sfz

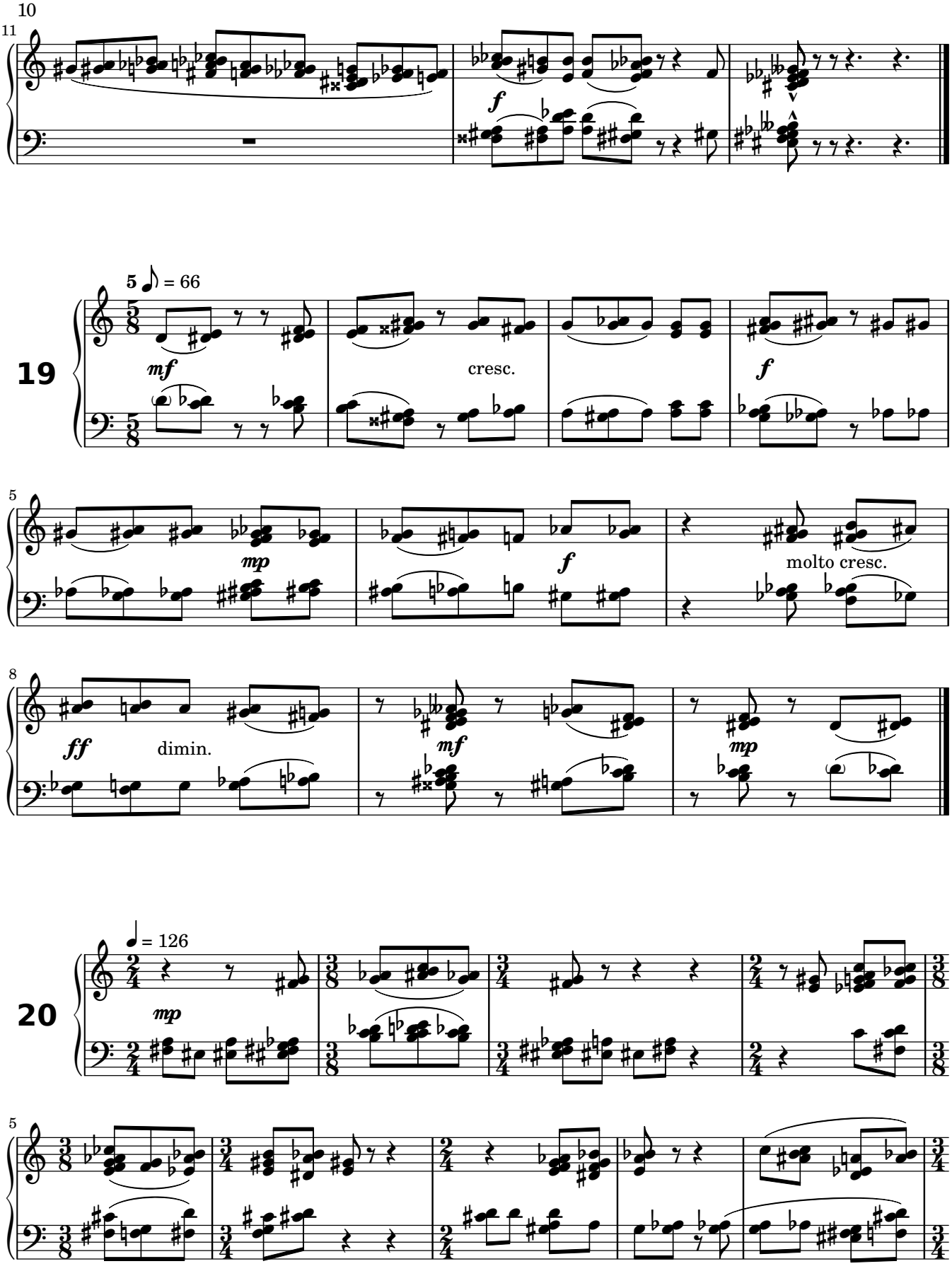

14
♩ = 144
p
3
mp
p

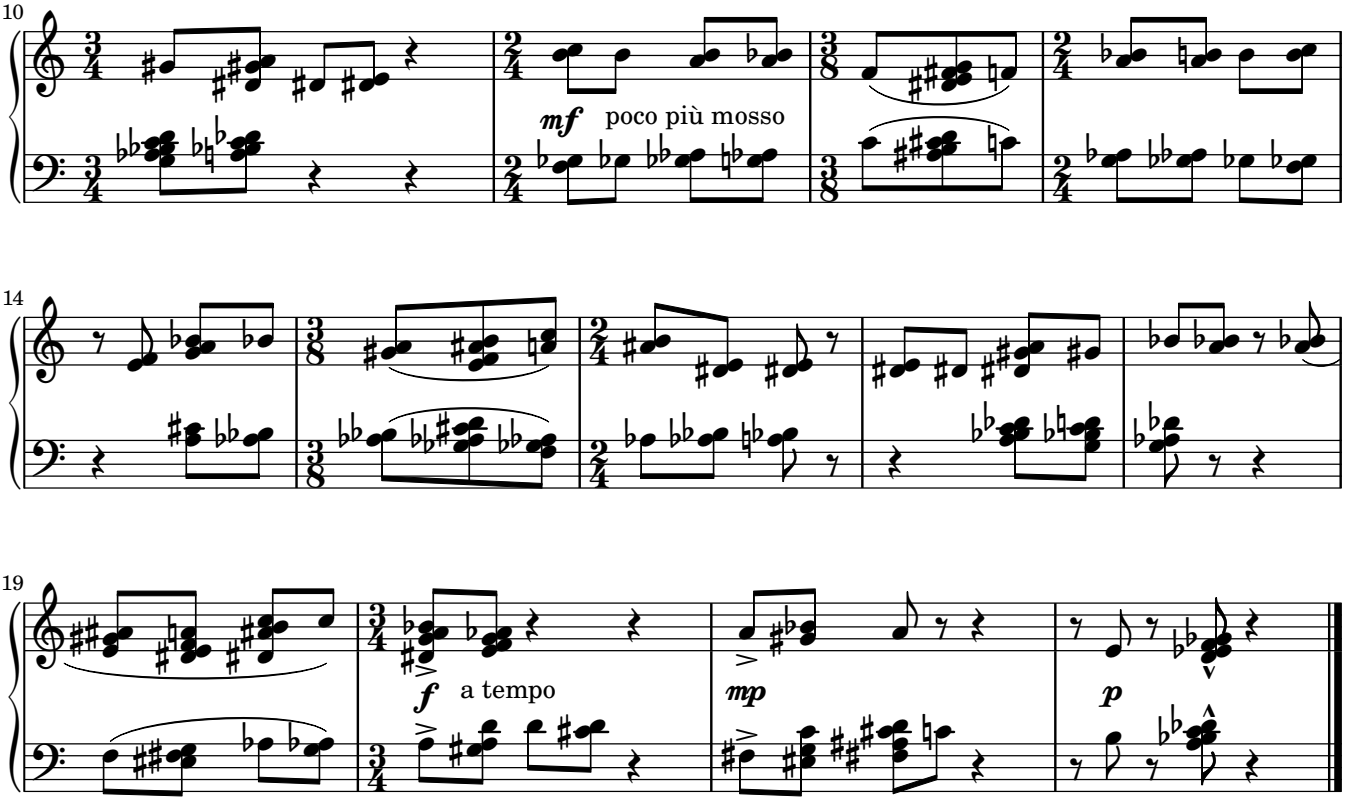

6
f
molto più mosso
9
mf
meno mosso
mp
11
p a tempo
15
5 = 54
f
mp
4
pp
8
ff
molto più mosso

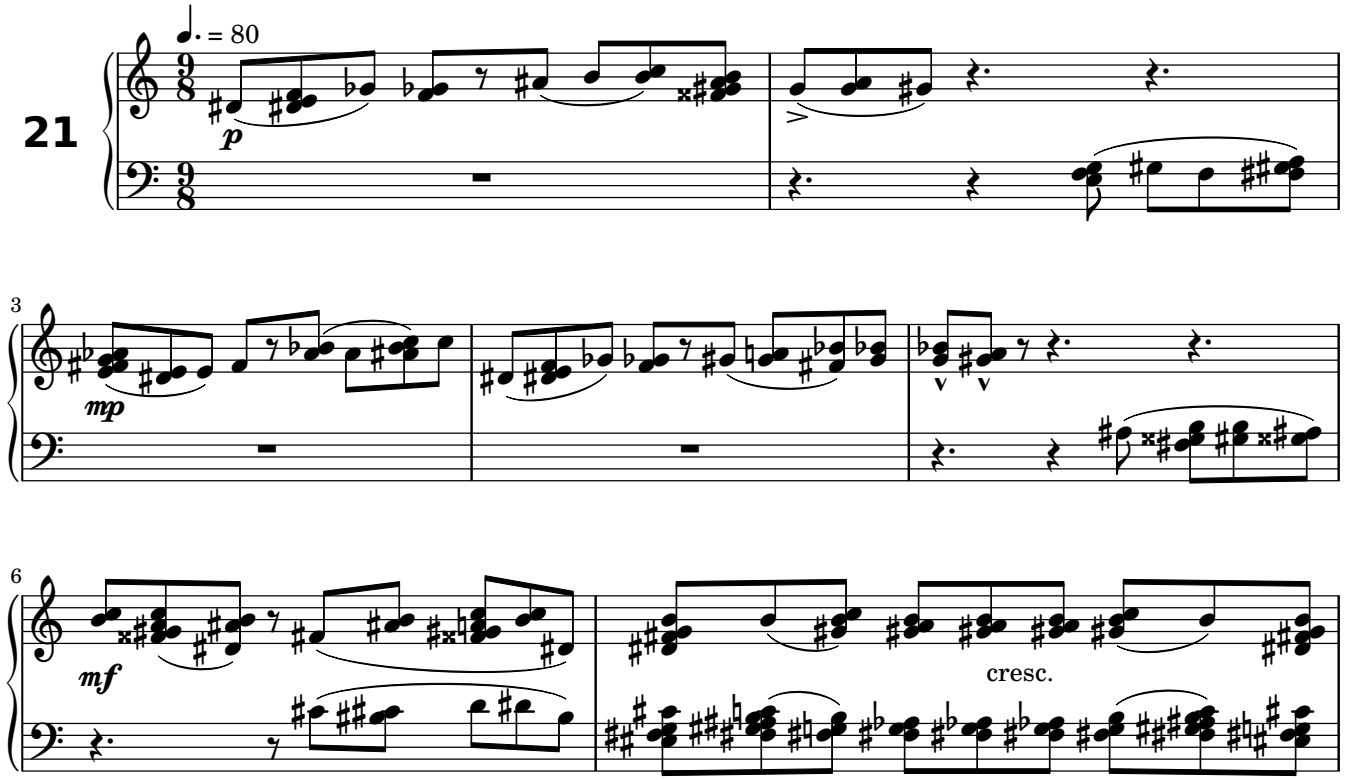

8
10
pp
ff
16
♩. = 88
f
3
p
6
p più mosso
mp
9
cresc.
f
p
17
♩ = 58
p
pp
mp
pp

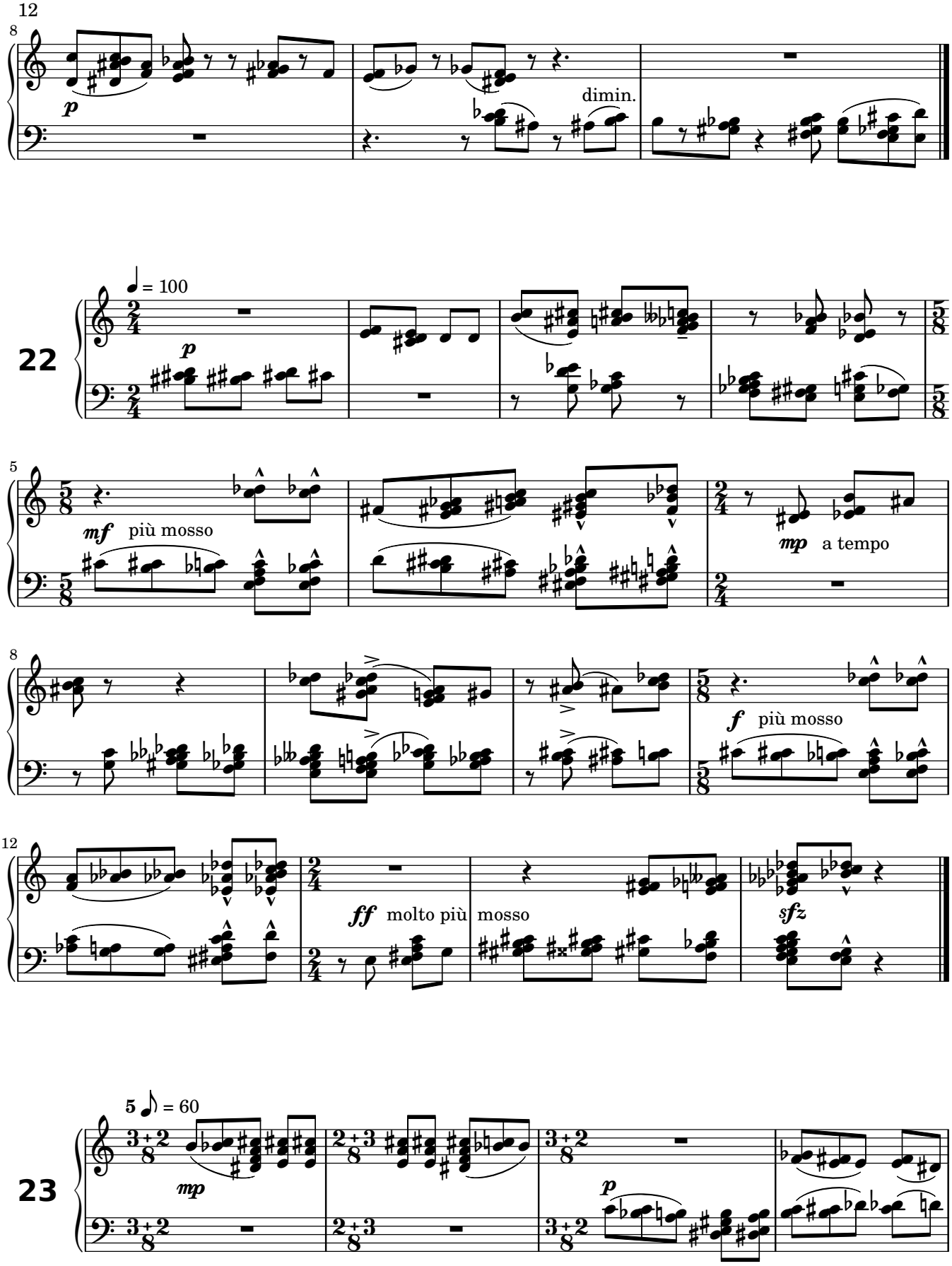

5
mf
cresc.
8
pp
f

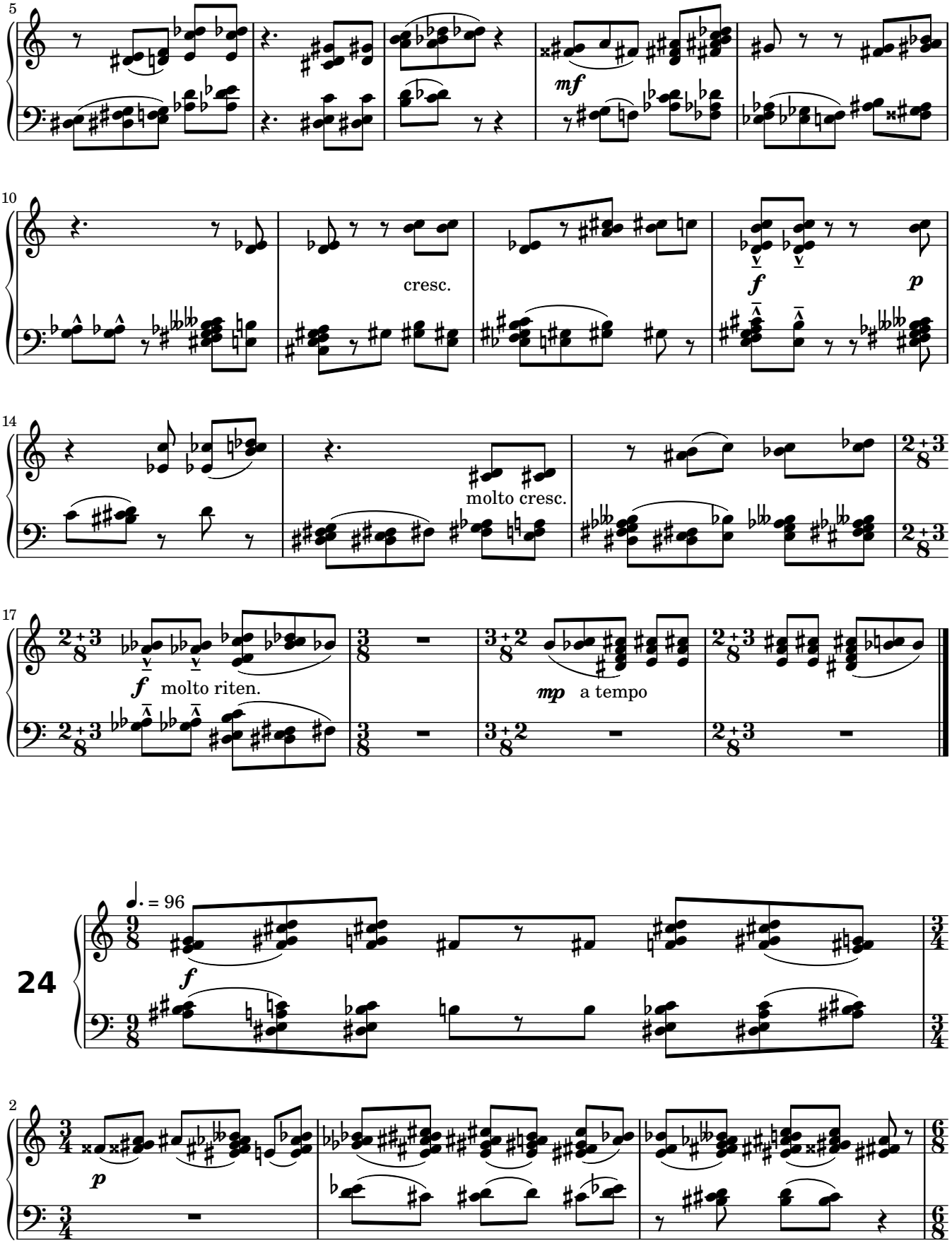

18
♩. = 88
mf
f
3
mf
mp
6
p
f
8
p
cresc. e ritard.
mf
pp
a tempo

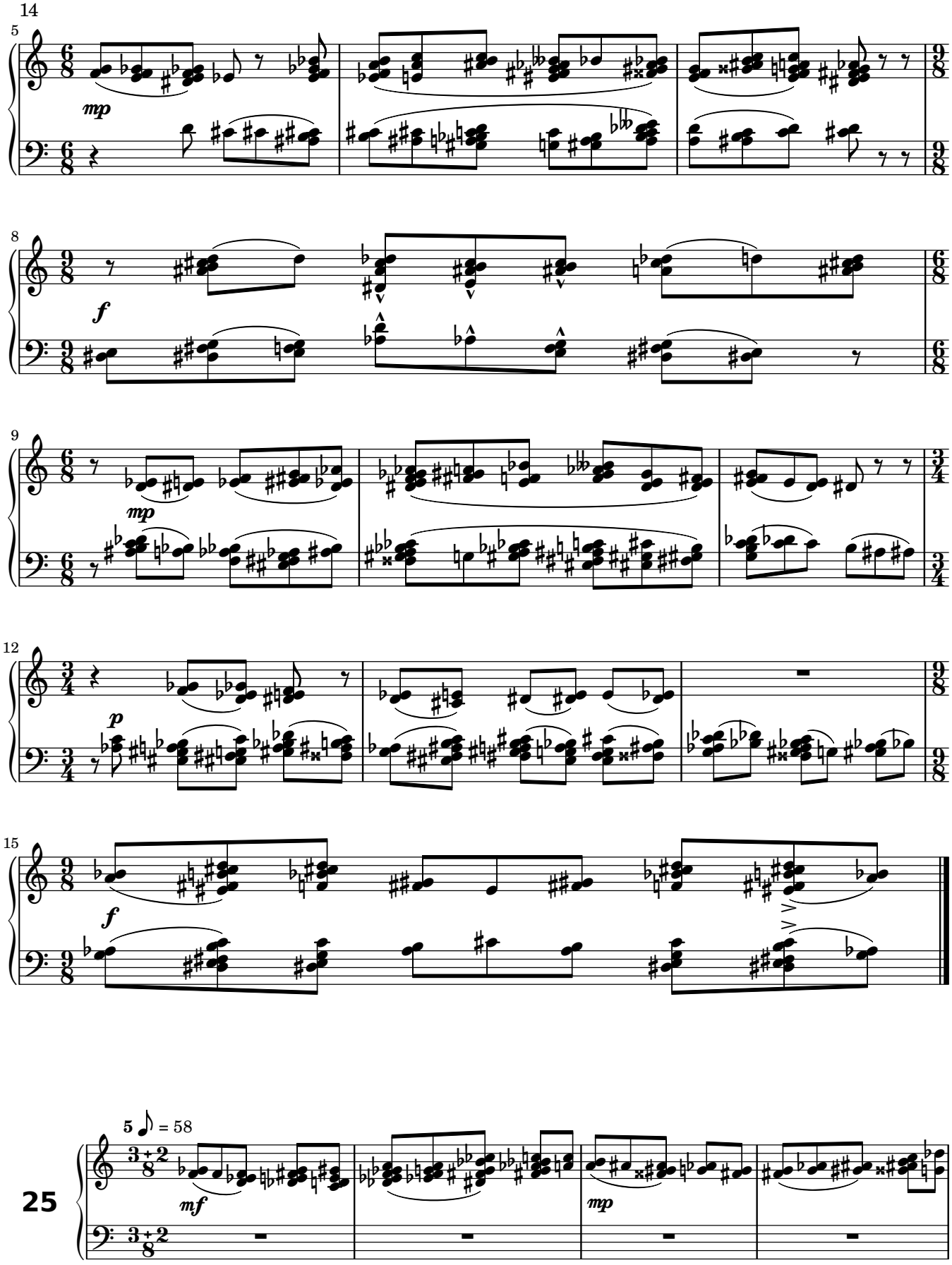

10
11
f
19
5/8
mf
cresc.
f
5
mp
f
molto cresc.
8
ff
dimin.
mf
mp
20
2/4
mp
5

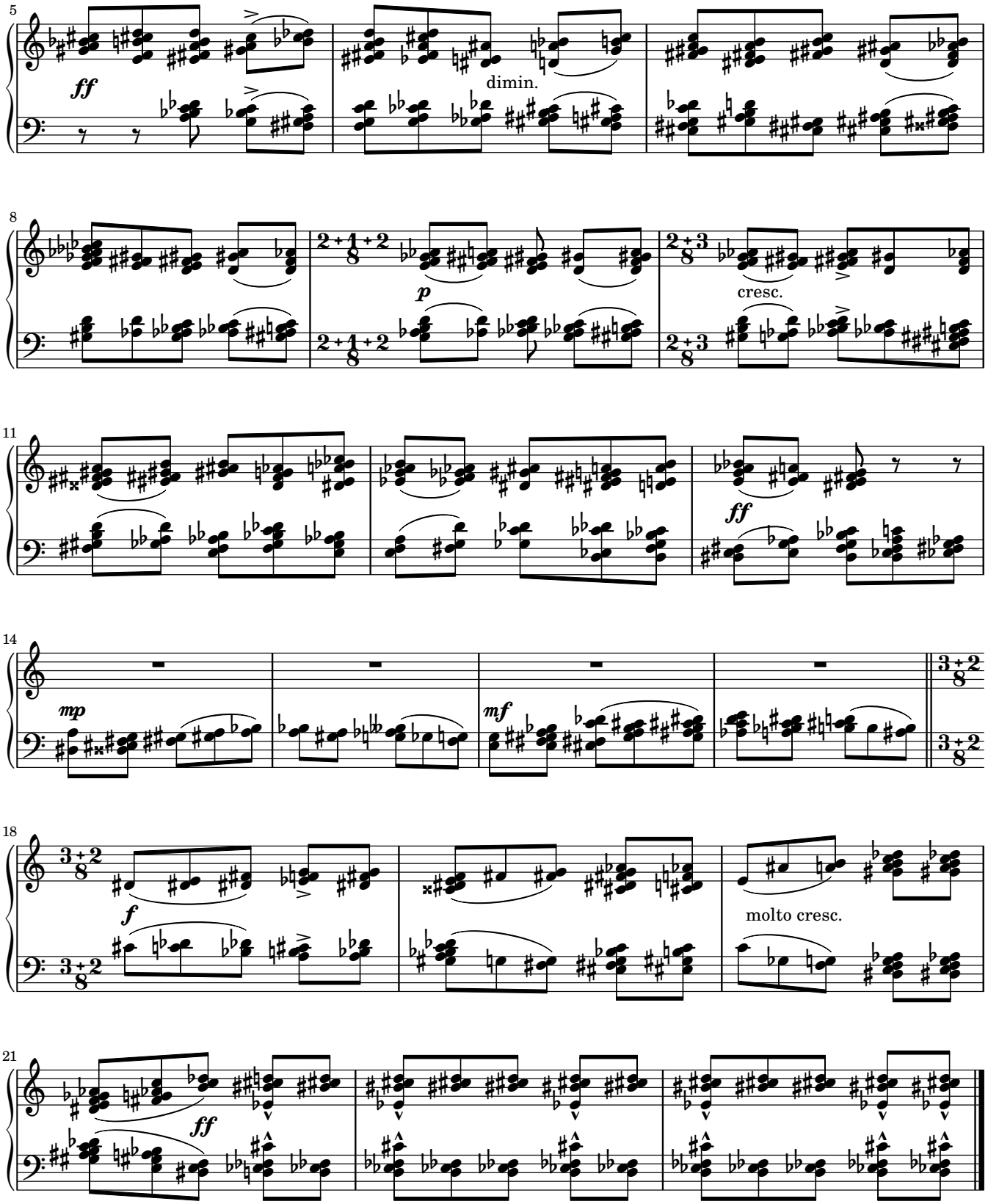

10
mf
poco più mosso
14
19
f
a tempo
mp
p


21
♩. = 80
p
3
mp
6
mf
cresc.


12
8
p
dimin.
22
= 100
p
5
mf
più mosso
mp
a tempo
8
f
più mosso
12
ff
molto più
mosso
sfz
5
= 60
23
mp
p


5
mf
10
cresc.
f
p
14
molto cresc.
17
f
molto riten.
mp
a tempo
24
♩. = 96
f
2
p


14
5
mp
8
f
9
mp
12
p
15
f
25
5 = 58
mf
mp


5
ff
dimin.
8
p
cresc.
11
ff
14
mp
mf
18
f
molto cresc.
21
ff

ConwayLife.com Source Graphs
(height = movement number)

	PATTERN NAME	DISCOVERER	YEAR
1:	Unidimensional Tumbler	Paul Callahan	1998
2:	Tetrominoes	––	––
3:	Gliders by the Dozen	Roger H. Rosenbaum	––
	House	––	––
	Long Hook	––	––
	Long Snake	––	––
	Pentadecathlon	John Conway	1970
	Pre–Pulsar	––	––
	Shillelagh	Charles Corderman	1971
	Thunderbird	––	––
4:	HighLife	Nathan Thompson	1994
5:	25P3H1V0.2	Dean Hickerson	1989
	Blinker Fuse	––	––
6:	2x2 6–Cell Still Lifes	––	––
	Lightweight Emulator	Robert Wainwright	1980
7:	Fast Forward Force Field	Dieter Leithner	1994
	Heavyweight Emulator	Robert Wainwright	1980
	Middleweight Emulator	Robert Wainwright	1980
	Trans Queen Bee Shuttle	Bill Gosper	1970
8:	25P3H1V0.1	Dean Hickerson	1989
	B29	Hartmut Holzwart	2004
	Blocked P4–2	Adam P. Goucher	2010
	Revolver	––	––
9:	Garden of Eden	Roger Banks	1971
10:	36P22	Jason Summers	2000
	46P4H1V0	Tim Coe	1996
	Eve	Andrzej Megier	2008
11:	60P5H2V0	Tim Coe	1996
	Edge–Repair Spaceship 1	David Bell	1992
	Glasses	––	––
12:	101	Achim Flammenkamp	1994
	Fireship	Simon Ekstroem	2016
	Pentadecathlon on 38P7.2	––	––
	Pentoad 2	––	––
	Siesta	David Buckingham	1973
13:	48P31	Mattias Merzenich	2010
	Blocked P4 T–Nose Hybrid	Mattias Merzenich	2010
	Jolson	Robert Wainwright	1984
	Pre–Pulsar Spaceship	David Bell	1998
14:	22P36	Naom Elkies	1995
	Blocked P4–1	Adam P. Goucher	2010
	Honeybit	Brice Due	2006
	Killer Candle Frobas	Robert Wainwright	1984
	Tritoad	David Buckingham	1977
15:	2x2 7–Cell Still Lifes	––	––
	Electric Fence	Dean Hickerson	1993
	Uninteresting P24	––	––

16:	HighLife 10−Cell Still Lifes	Nathan Thompson	1994
	Mold on 36P22	Jason Summers	−−
	Pre−Pulsar Shuttle 28	−−	−−
	Wickstretcher 1	Hartmut Holzwart and Dean Hickerson	1992
17:	Monogram Synth	Mark D. Niemiec	−−
	P35 Honey Farm Hassler	Dongook Lee	2016
	Twin Bees Shuttle V2	David Bell, Bill Gosper and Heinrich Koenig	1971
18:	Backrake 1	Jason Summers	−−
	Boring P24	−−	−−
	Ecologist	−−	−−
	Fumarole on 34P13	Nikolay Beluchenko	2009
	Lake 2 Synth	−−	−−
	Pre−Pular Shuttle 29 V2	David Buckingham	1980
19:	119P4H1V0	Dean Hickerson	1989
	69P48	Naom Elkies	2002
20:	Ellison P4 HW Emulator Hybrid	Scot Ellison	2010
	Eureka V2	David Buckingham	1980
	Gourmet	David Buckingham	1978
	Pentadecathlon on 38P7.2	−−	−−
	Pentadecathlon on Snacker	−−	−−
	Schick Engine	Paul Schick	1972
21:	50P35	Jason Summers	2002
	77P4H1V0.1	−−	−−
	B−52 Bomber	Naom Elkies and David Bell	1996
	Figure Eight on 36P22	−−	−−
	Fumarole on 34P13	Nikolay Beluchenko	2009
	True Period 22 Gun	David Eppstein	2000
22:	Blocked P4−2	Adam P. Goucher	2010
	Edge−Repair Spaceship 2	Stephen Silver	2000
	Pipsquirter 1 as Reflector	Naom Elkies	1997
	Queen Bee Shuttle	Bill Gosper	1970
	Skewed Traffic Light	Robert Wainwright	1989
	Trans Queen Bee Shuttle	Bill Gosper	1970
	Wasp	David Bell	1998
23:	98P25	Naom Elkies	2002
	Blocked P4−1	Adam P. Goucher	2010
	Buckaroo	David Buckingham	−−
	Crown	Naom Elkies	1995
	P32 Blinker Hassler	Naom Elkies	2010
	P60 Hassler	Naom Elkies	2002
	Snark	Mike Playle	2013
24:	48P31	Mattias Merzenich	2010
	P35 Beehive Hassler	Dean Hickerson	1995
	Two Pre−L Hasslers	Robert Wainwright	1983
25:	144P24	Naom Elkies	1994
	65P13.1	David Buckingham	1996
	Blinker Puffer 2	David Bell	1992
	Light Speed Oscillator 2	Josh Ball	2007

Graphs listed twice are mutually perpendicular.